

Case Report

Customizing Abutments for Optimal Emergence Profile: A Case Report on Implant-Supported Restorations

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Abstract:

Dental implants have become the preferred treatment option for missing teeth replacement due to their functional and restorative benefits. However, placing implants in the esthetic zone remains a challenge due to anatomical factors and the need for optimal emergence profile. The use of custom abutments and regenerative techniques in this case report resulted in a successful implant-supported restoration with excellent functional and aesthetic outcomes. The case highlights the importance of proper treatment planning and the use of advanced techniques in implant dentistry to achieve optimal results.

Keywords: Dental Implants; Custom Abutments; Esthetic Zone; Soft Tissue Augmentation.

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Introduction:

Dental implants have become the go-to option for patients who are missing teeth. With the ability to replicate natural teeth in both function and aesthetics, they have transformed the field of restorative dentistry. While implant placement can be obstructed by anatomical factors¹, advancements in bone regenerative materials and soft tissue augmentation techniques have made it possible to overcome many of these challenges². As a result, implant placement has become more predictable, with high survival rates and excellent outcomes.

In particular, implant placement in the esthetic zone, such as the anterior maxilla, remains a challenge due to the increased visibility of the area³. However, the use of natural profile abutments, tooth-colored abutments, and wide temporary healing abutments has made it

possible to achieve an optimal emergence profile for implant-supported restorations. With the growing patient acceptance of dental implants in the esthetic zone, it is crucial for dental professionals to prioritize both function and aesthetics in their treatment planning. By doing so, they can provide their patients with a functional, long-lasting, and aesthetically pleasing outcome that meets their needs and expectations⁴.

Case Report 1:

A 65-year-old male patient reported to the Department of Periodontics with a chief complaint of a missing lower left front tooth 10 years back due to mobility. After thorough medical and dental history was taken, a clinical and radiographic examination was performed. On clinical examination partially edentulous area seen in relation to 31 and 32, (Fig 1; A). After phase I and phase II therapy, during the restorative phase patient

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opted for implants in relation to the aforementioned area. Radiographic analysis revealed adequate bone for implant placement (Fig 1; B, C). Because of the intruding crown from 33 & teeth drifting, ideal space is not available for placing two implants of 3mm wide, a single abutment with splinted crowns, single abutment & a pontic or implants with lesser width (2.8) may be considered. Routine blood investigations were done and the patient was deemed fit for implant placement. A 3.5 X 11 mm Biotech implant was selected for the implant placement. Mental nerve block was given on the left side and a mid crestal incision with releasing incision was made. The underlying bone was inspected and an osteotomy was performed using a lance drill in the edentulous span. The initial osteotomy was made using a 2.0mm diameter drill till a depth of 11 mm. Subsequent drilling was done till a diameter of 3.4 mm and the implant was inserted with a torque ratchet till the insertion torque of 40Ncm was achieved (Fig 1; D, E)). Suturing was done using 3-0 silk suture (Fig 1; F).

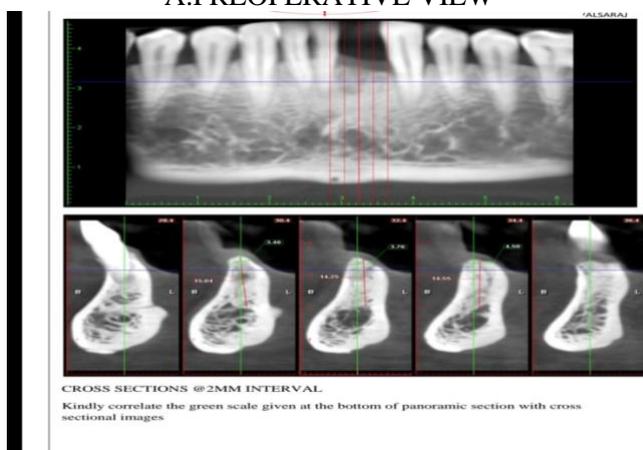
Antibiotic and anti-inflammatory drugs were prescribed and post-operative instructions were given. The patient was recalled after one week for suture removal ((Fig 1;G) and after 3 months for evaluation of osseointegration using an IOPA x-ray (Fig 1; H,I). Second stage surgery was performed by removing the cover screw and placing a healing screw. After two weeks, the healing screw was removed and a close tray impression transfer coping was screwed into the implant. An impression was made using single stage putty wash technique. A custom angulated abutment was fabricated on the cast and a metal ceramic prosthesis was fabricated on the abutment. The patient was recalled after three days, the healing screw was removed and the prosthesis was screwed in place using a ratchet till the torque of 35Ncm was achieved. The hole was closed with composite resin (Fig 1; J). The patient was satisfied and happy with the aesthetic and functional outcome of the prosthesis.



A.PREOPERATIVE VIEW



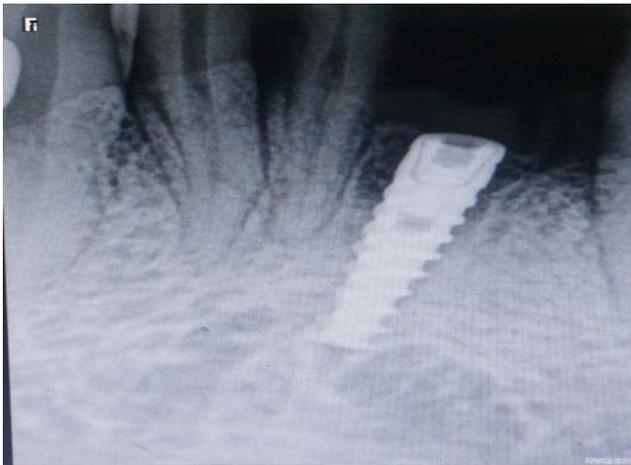
B.PREOPERATIVE OPG



C.PREOPERATIVE CBCT



D.INSERTION OF IMPLANT



E.IOPA OF IMPLANT IRT 31



F.IMMEDIATELY AFTER ABUTMENT PLACEMENT



G.HEALING AFTER A WEEK



H.IOPA OF IMPLANT ABUTMENT PLACEMENT



I.HEALING AFTER 3



J.IMPLANT CROWN CEMENTATION

Fig 1: Implant abutment placement irt 31 & 32.

Case Report 2:

A 62-year-old male patient reported to the Department of Periodontics, with a chief complaint of missing lower back teeth due to localized periodontitis. After a thorough discussion of various treatment options (Fig 2; A, B), implant placement was agreed upon. A Hi-Tec tapered self-threaded endo-osseous implant measuring 3.75mm x 10 mm and 4.2mm x 10mm was selected. An

injection of 2% lidocaine with 1:80,000 anaesthetic agent was given for the area of the missing second premolar and first molar, and a lingually positioned full-thickness incision was made (Fig 2; C). The implant was placed following an osteotomy drilled with the help of a surgical template. Primary stability was achieved, and a healing abutment was placed (Fig 2; D,E,F)). Appropriate antibiotics and analgesics were prescribed, and post-operative instructions were given.

After six weeks, the healing abutment was removed, and an impression coping was placed. A Poly Vinyl Siloxane open-tray impression was taken to capture the position of the implant. The impression coping was removed, and the healing abutment replaced, and the case was sent to the laboratory for temporary crown and custom abutment fabrication. After eight weeks of healing, the customized abutment was placed, torqued to 35N with the help of a torque wrench, and a temporary crown was cemented. After 16 weeks of

healing, the temporary crown was removed, and the gingival was observed for healing. The final restoration was delivered at 20 weeks after implant placement. The crown was cemented using a resin-modified glass ionomer cement. The patient was satisfied with the final esthetic and functional outcome of the treatment. The final restoration exhibited an adequate amount of interdental papilla and similar buccal contours to the adjacent tooth. The patient was instructed in oral hygiene and recalled after three months for a regular check-up.

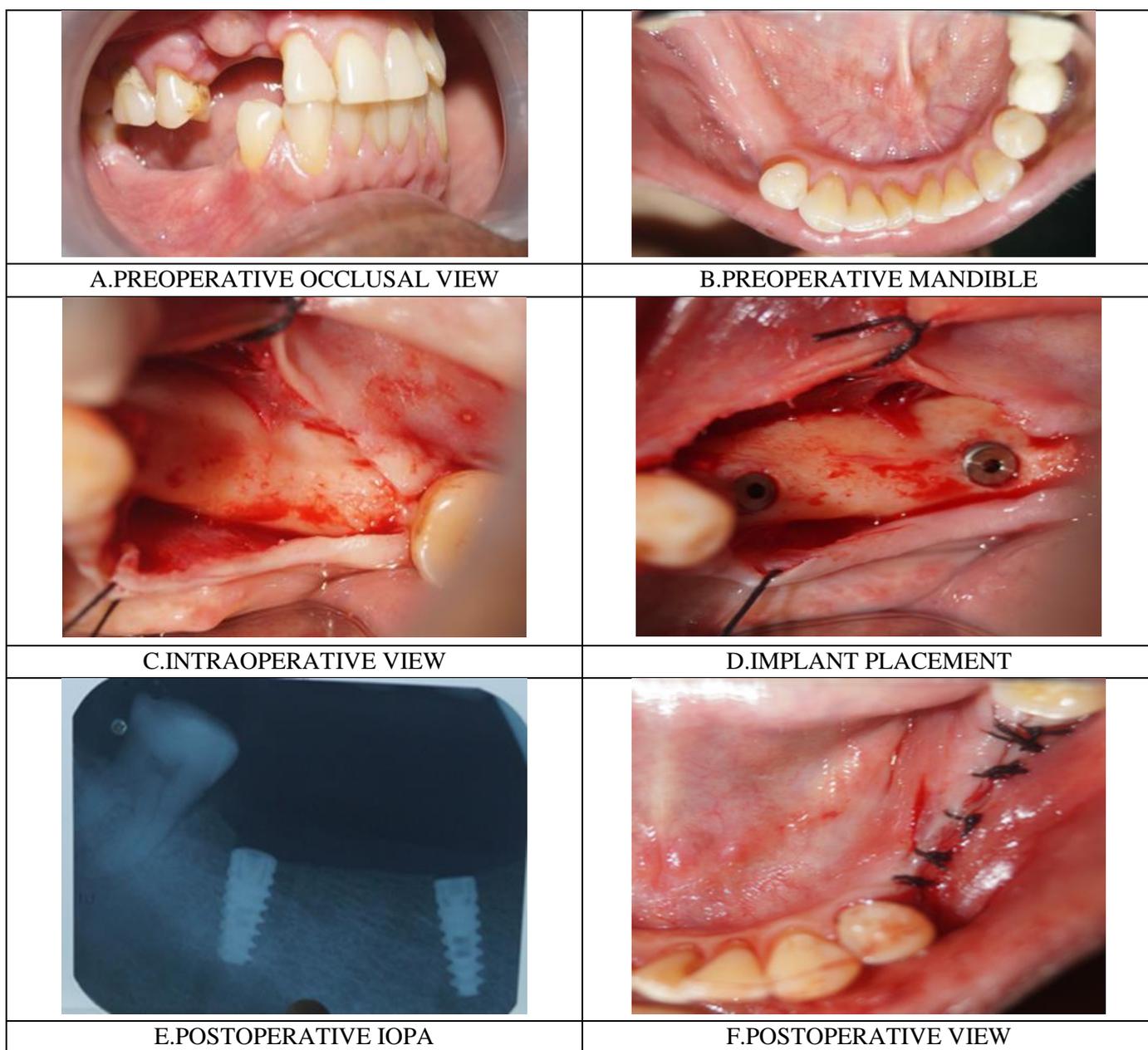


Fig 2: Implant placement irt 45 &46.

When it comes to replacing missing teeth, there are several treatment modalities available, including fixed partial dentures, removable partial dentures, and resin bonded bridges⁵. However, dental implants have become increasingly popular due to their many benefits, such as the maintenance of residual bone, ease of oral hygiene, increased longevity, and non-involvement of adjacent teeth.

In a recent review conducted by Prithviraj et al, it was found that most surgeons prefer delayed placement of implants followed by immediate loading⁶. However, it's essential to note that dental implants are not suitable for everyone, and a thorough evaluation by a qualified dental professional is necessary to determine if a patient is a suitable candidate for the procedure. Factors such as the quality and quantity of the patient's bone, overall health, and oral hygiene habits must be taken into consideration before a treatment plan is formulated.

In this case, the clinician opted for a dental implant-supported prosthetic due to the potential drawbacks associated with the alternative treatment modalities. The success of dental implant treatment depends on proper maintenance and regular follow-up visits with the dental professional. Patients must adhere to a strict oral hygiene regimen and attend regular check-ups to ensure the longevity of their dental implant-supported prosthetics.

When it comes to the actual implant procedure, a study conducted by Froum et al found that there was no significant difference in the success rates of single tooth implants between patients who underwent flapless surgeries and those who underwent traditional flap procedures⁷. Both groups displayed similarly high rates of implant survival, as well as stable marginal bone and pocket depths.

However, proper prosthetic concepts must also be followed to ensure the success of the selected treatment modality. This includes taking into account factors such as implant integration and soft-tissue healing, emergence profiles, occlusal forces, and progressive loading to ensure maximum aesthetics and function.

Overall, the selection of the appropriate treatment modality for replacing missing teeth depends on various factors, and the clinician must carefully

evaluate each option and discuss them with the patient to determine the most suitable course of action. By following proper evaluation, treatment planning, and prosthetic concepts, patients can enjoy long-term, aesthetically pleasing solutions to their missing teeth.

Conclusion

Both case reports demonstrate the success of dental implant placement as a treatment option for missing teeth due to periodontitis. Thorough evaluation, proper implant selection, and standard implant placement protocols followed by prosthetic rehabilitation can lead to satisfactory functional and aesthetic outcomes. These reports highlight the importance of careful treatment planning and follow-up care to ensure the long-term success of dental implants.

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